MEMORANDUM ON THE INSPECTION OF BARK BEETLE INFESTATIONS IN THE POWELL NATIONAL FOREST, UTAH

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An examination was made of bark beetle infested trees in the Powell National Forest adjacent to and within Bryce Canyon National Park on September 5, 1936, in company with Mr. Farrell from the Regional Office, Supervisor Folster, Rangers Cook and Jacobs, and Park Ranger Cope. On September 6 and 7 trees were examined on other districts of the forest, with Rangers Jacobs and Astle.

East Fork District

In the southwest portion of Bryce Canyon National Park it appears that the Black Hills beetle (Dendroctonus ponderosae Hopk.) is building up to an epidemic stage in ponderosa pine. The same condition may prevail on adjacent National Forest land. Scattered groups of red tops occur in this area, with from 3 to 6 trees in a group, and in one case 12 trees were found in one group. New attacks could not be found in the immediate vicinity of all of these groups, but in the comparatively small area covered, one group of 5 newly attacked trees was observed in close proximity to 6 trees of last year. Several individual trees of large diameter were also noted with new attacks by the Black Hills beetle. The southwestern pine beetle (D. barberi Hopk.) was apparently very scarce in this area, and practically none were found associated with the Black Hills beetle in the base of the new trees.

From the limited number of new trees observed, it was impossible to determine whether the infestation was increasing or decreasing. It was decided that a survey would be the most practical means of obtaining data on the number of newly attacked trees. This survey, consisting of at least a 5 percent cruise, was to cover a tier of sections adjacent to the Park. The Park Service, I understood, intended to make a somewhat similar survey within their boundaries.

Earlier in the summer Mr. De Leon, from the Park Service Office in Berkeley, made an examination of the Park area and, as the number of red tops would indicate, considered the infestation serious enough to warrant control measures. His report, however, was not available, apparently being in the files in Zion Park, and consequently it was impossible to ascertain whether he had time to estimate the number of infested trees from last year's attacks which could be used for comparison with the current survey figures, when completed. If the present survey shows the need for control it is likely that the work will be started this fall. Or if the Park Service carries on control it is the intention of the Powell Forest to protect this work by treating any infested trees occurring in areas adjacent.

Felling and burning is the most effective method of control. The burn, on the infested portion of the bole and large limbs, should be heavy enough to destroy the bark, thus definitely insuring a complete kill of all the beetle broods beneath. Peeling is also an effective method against the Black Hills beetle in the larval stage and could no doubt be used with good

results between October and early June, when fire danger prevents burning. In early summer, as the new adult beetles begin to develop in considerable numbers, the peeling method becomes less effective since many of these adults could escape unless injured mechanically in the removal of the bark. With the southwestern pine beetle burning of the bark is necessary since the larvae develop out in the bark and are not disturbed or exposed when the peeling method is used. However, the southwestern pine beetle is apparently very scarce in this area and can be disregarded should it be necessary to resort to peeling. It should also be mentioned that limber pine is susceptible to attack by the Black Hills beetle and frequently produces large broods of this beetle. Any infested limber pine found in this area should be treated the same as ponderosa pine.

Escalante District

On the Escalante District, in the general vicinity of Cow Puncher Ranger Station, rather widely scattered red tops are present in ponderosa pine. Groups are absent except in rare cases where a group of 2 or 3 trees occur. Out of 25 of these faded trees examined about 20 of them showed only the winding galleries of the southwestern pine beetle in the lower bole, as high as could be reached with an ax. The lack of Black Hills beetle galleries extending to the lower bole was so consistent that I believe the southwestern pine beetle is the most prevalent species in this area. The type of trees attacked also indicated that the beetles were not particularly aggressive, as is usually the case with the southwestern pine beetle in this part of its range. Practically all of the faded trees were either over-

mature, spike topped, lightning struck, or apparently unhealthy. This condition is in contrast with the Bryce Canyon area where groups of more vigorous trees are being attacked.

Several trees were found which had only recently faded, and in these the southwestern pine beetle had already developed to the mature larval, pupal, and new adult stages. These trees may have been attacked in the spring or early summer, and it is possible that a second or partial second generation of the southwestern pine beetle is produced in this region, and that attacks are made both in the spring and in late summer or fall.

In only about 5 of the 25 trees examined was the Black Hills beetle found prevalent in the lower bole. It is likely of course that a number of these beetles occurred in the upper bole of the other trees since under endemic conditions the Black Hills beetle is frequently found in small numbers in weakened trees in association with other bark beetles. Practically no new attacks were observed, although the time spent in searching for these was limited.

Considering the apparent prevalence of the southwestern pine beetle, the type of tree being attacked and the scattered nature of the infestation, it was my recommendation that even a survey of this particular area would not be needed at this time. However, this area should be watched closely during the next couple of years for any possible change in the infestation. An examination next spring, after the newly infested trees have faded, should give some indication as to whether the number of attacked trees is

increasing or decreasing. Note should be made particularly of groups of infested trees, if they occur, in contrast to the present condition of scattered individual trees.

Another area of ponderosa pine, viewed from a distance, looking north toward Boulder Mountain from Hell's Back Bone bridge, appeared to be similar to the area around Cow Puncher Ranger Station with a few scattered individual red tops. This and any other similar areas should be checked again next spring for evidence of possible increasing beetle infestation.

Johns Valley District

On this district several faded ponderosa pine, occurring above Widtsoe, were examined. The most prevalent beetle galleries in these trees were those of the southwestern pine beetle, with a few galleries of the Black Hills beetle and what appeared to be the roundheaded pine beetle (D. convexifrons Hopk.). Based on the areas seen, it appears that the pine beetles are at a low stage on the Johns Valley District.

General

Dead and dying Douglas fir, attacked by the Douglas fir beetle (D. pseudotsugae Hopk.), was rather common in and adjacent to Bryce Canyon National Park. The epidemic of this beetle is evidently so widespread that it would be very difficult to control at this time. On the Johns Valley District some alpine fir was being killed by the alpine fir beetle (Dryocoetes confusus Sw.). Damage by these two beetles has been prevalent in a number of forests in the Rocky Mountains during the past 2 or 3 years, and similar conditions apparently exist in the Powell National Forest. With the

return of above-normal precipitation in Region 4 this season, following several drought years, it is possible that increased tree vigor may retard these particular beetles. However, this will probably have little effect on the Black Hills beetle where it is already in an epidemic stage. A recent survey on the Dixie National Forest indicates that the epidemic there is continuing.

It was reported that on Boulder Mountain, on the Escalante District, an insect epidemic had swept through the spruce stands during the past 10 years. With the destruction of practically all the large spruce timber, the epidemic has apparently run its course. Although this area was not visited it seems likely that the destruction was caused by the Engelmann spruce beetle (Dendroctonus engelmanni Hopk.).

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